

Abstract Submitted
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Study of $^{14}\text{C}(\alpha, \gamma)^{18}\text{O}$ using n- and α transfer reactions with HELIOS¹ HYE YOUNG LEE, Los Alamos National Lab, J.P. SCHIFFER, B.B. BACK, J.P. GREENE, C.R. HOFFMAN, B.P. KAY, K.E. REHM, Argonne National Lab, A.H. WUOSMAA, D. SHETTY, Western Michigan University, J.C. LIGHTHALL, S.T. MARLEY, Western Michigan University, ANL, C.M. DEIBEL, Argonne National Lab, JINA — The partial widths of states near threshold are crucial to characterize the rates of thermonuclear capture reactions. Direct measurements are often difficult, because cross sections are small. We have studied the $^{17}\text{O}(\text{d}, \text{p})^{18}\text{O}$ and $^{14}\text{C}(\text{}^6\text{Li}, \text{d})^{18}\text{O}$ reactions in inverse kinematics to populate excited states near and above the n- and α - thresholds in ^{18}O using the HELIOS spectrometer at ANL. HELIOS was essential to obtain the Q-value resolution necessary to separate the individual excited states, as well as to provide high coincidence efficiency for determining the specific decay modes. The branching ratios ($\Gamma_\alpha/\Gamma_\gamma$ and Γ_n/Γ_γ) will be presented and compared to the other experiments. Results from the α -transfer reaction of ${}^6\text{Li}(\text{}^{14}\text{C}, \text{d})$ using HELIOS will also be discussed.

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